

**Birzeit University**  
**Mathematics Department**  
**Math234**  
**Quiz 1**

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**Name:**.....  
**Section:** 3

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**Question I [5 points]. True or False?**

1. A homogeneous system must have a nontrivial solution.
2. If a matrix is in REF, then it is also in RREF.
3. If  $A$  is a  $3 \times 5$  matrix, then the linear homogeneous system  $Ax = 0$  has only the trivial solution.
4. If  $Ax = b$  is an overdetermined and consistent linear system, then it must have infinitely many solutions.
5. If the REF of the matrix  $A$  involves a free variables, then the linear system  $Ax = b$  has infinitely many solutions.

**Question II [5 points].** Consider the linear system

$$\begin{aligned}x_1 + x_2 + x_3 &= 2 \\-x_1 + x_2 + x_3 &= 4 \\x_1 + 2x_2 + \alpha x_3 &= \beta\end{aligned}$$

Find the values of  $\alpha$ ,  $\beta$  that make the system is

- a. consistent.
- b. inconsistent.

**Good Luck**